

GENERAL PHARMACY

UNIT 2

General Pharmacy

Introduction to Pharmaceutical Calculations and Dosage Forms



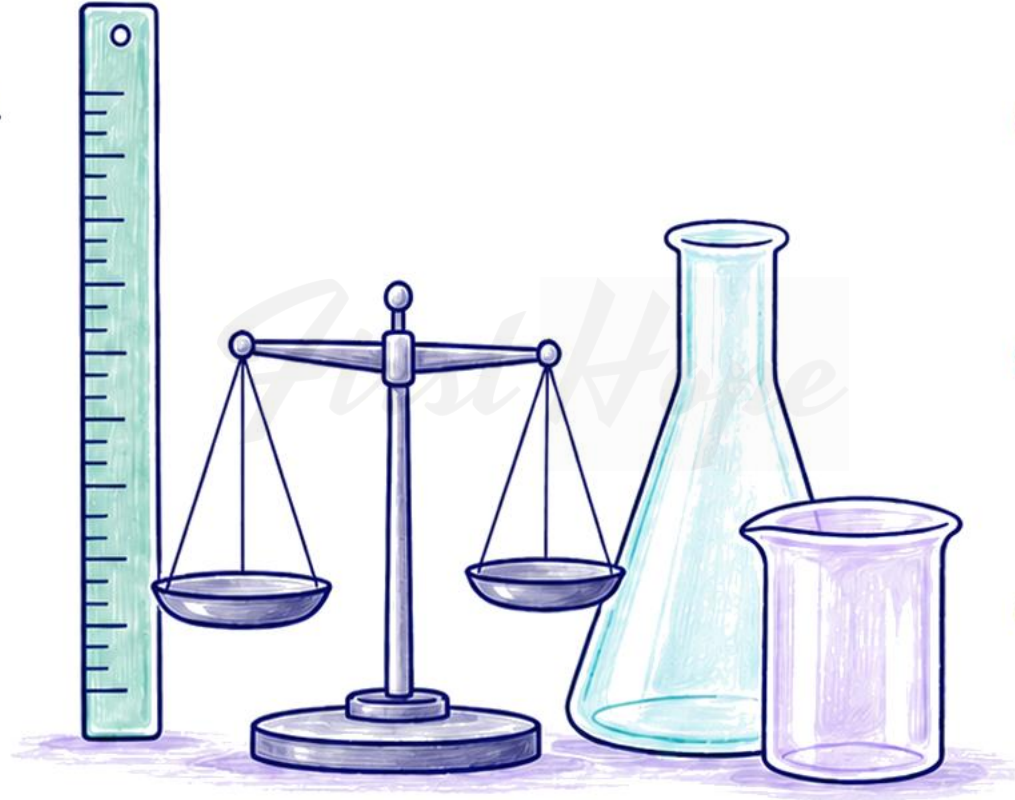
METRIC SYSTEM: DEFINITION AND BASIC UNITS

SYSTEM:

SI is the internationally agreed decimal system for scientific measurement.

PHARMACY:

Common practical units include g, mg, mcg, L, and mL.



- **LENGTH:**

The metre, symbol m, is the SI base unit of length.

- **MASS:**

The kilogram, symbol kg, is the SI base unit of mass.

- **VOLUME:**

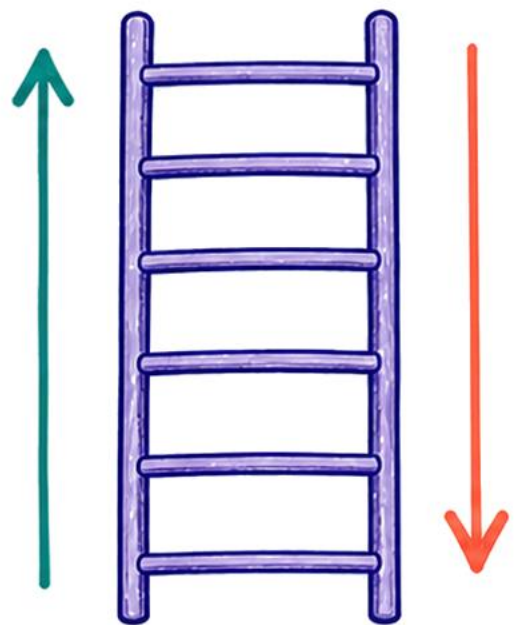
The coherent SI unit is m^3 ; litre is accepted for use with SI.

PRINCIPLE:

Decimal units support clear conversion, calculation, comparison, and standardised communication.

METRIC PREFIXES AND POWERS OF TEN

IDEA: A prefix scales a unit by a specified power of ten.



LARGER: kilo $k = 10^3$, hecto $h = 10^2$, deca $da = 10^1$.

SMALLER: deci $d = 10^{-1}$, centi $c = 10^{-2}$, milli $m = 10^{-3}$.

VERY SMALL: micro $\mu = 10^{-6}$ and nano $n = 10^{-9}$.

CASE: Symbols are case-sensitive;
M means mega, while m means milli.

SAFETY: Attach one prefix to one unit
and never mix dimensions on a ladder.

PHARMACEUTICAL METRIC CONVERSIONS

MASS:

- $1 \text{ kg} = 1000 \text{ g}$; $1 \text{ g} = 1000 \text{ mg}$; $1 \text{ mg} = 1000 \text{ mcg}$.

VOLUME:

- $1 \text{ L} = 1000 \text{ mL}$; litre is accepted for use with SI.

LENGTH:

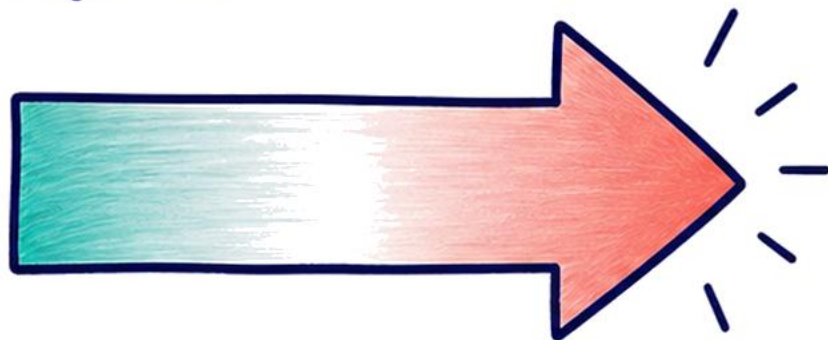
- $1 \text{ m} = 100 \text{ cm} = 1000 \text{ mm}$.

SMALL UNITS:

- $1 \text{ microgram} = 1000 \text{ nanograms}$;
- $1 \text{ mL} = 1000 \text{ microlitres}$;
- $1 \text{ cm} = 10 \text{ mm}$.

METHOD:

- Multiply when moving to a smaller unit;
divide toward a larger unit.



EXAMPLE:

- $0.25 \text{ g} \times 1000 \text{ mg/g} = 250 \text{ mg}$,
with units cancelling visibly.

CHECK:

- Confirm dimension, decimal position, unit case, and a reasonable final magnitude.

ALLIGATION: PRINCIPLE AND MEDIAL METHOD

PURPOSE:

Alligation relates component quantities and strengths in a mixture calculation.

MEDIAL:

Use it when component quantities are known and mixture strength is required.

CONDITIONS:

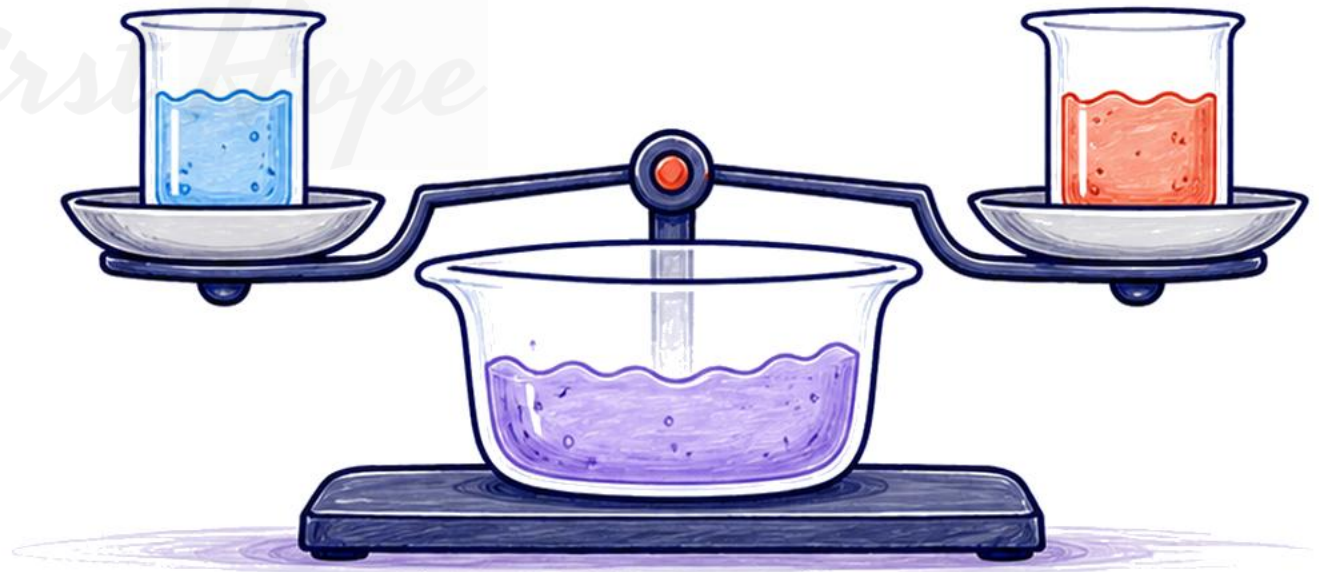
Express every strength on the same basis and use compatible quantities.

EQUATION:

Mixture strength = $\Sigma(\text{quantity} \times \text{strength}) \div \Sigma(\text{quantity})$.

EXAMPLE:

Equal amounts of 10% and 20% give $(10 + 20) \div 2 = 15\%$.



BOUNDARY: The weighted average does not prove compatibility, additivity, stability, or product quality.



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